



Section 1: Chemical Product Identification

Product Name: Manganese Dioxide

CAS#: 1313-13-9

Synonym: Manganese (IV) Dioxide; Manganese Superoxide; Manganese Peroxide; Black manganese oxide; Manganese Black; Pyrolusite Brown

Chemical Name: Manganese Dioxide

Chemical Formula: MnO₂

Section 2: Composition and Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
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Manganese Dioxide	1313-13-9	78-80%	No

Section 3: Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available.

MUTAGENIC EFFECTS: Not available.

TERATOGENIC EFFECTS: Not available.

DEVELOPMENTAL TOXICITY: Not available.

The substance may be toxic to blood, the nervous system, liver, central nervous system (CNS).

Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available.

Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Contact with combustible or organic materials may cause fire.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose off according to local and regional authority requirements.

Large Spill:

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow evacuating through the sanitary system. Be

careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as reducing agents, combustible materials, organic materials, acids.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:

Splash goggles.

Lab Coat.

Dust respirator. Be sure to use an approved/certified respirator or equivalent.

Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles.

Full suit.

Dust respirator.

Boots.

Gloves.

A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

CEIL: 5 (mg/m³) from OSHA (PEL) [United States] Inhalation

TWA: 0.2 (mg/m³) from ACGIH (TLV) [United States] Inhalation

Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid.

Odor: Odorless.

Taste: Not available.

Molecular Weight: 86.94 g/mole

Color: Black to Brownish-Black
pH (1% soln/water): Not applicable.
Boiling Point: Not available.
Melting Point: 535°C (995°F)
Critical Temperature: Not available.
Specific Gravity: 5.026 (Water = 1)
Vapor Pressure: Not applicable.
Vapor Density: Not available.
Volatility: Not available.
Odor Threshold: Not available.
Water/Oil Dist. Coefficient: Not available.
Ionicity (in Water): Not available.
Dispersion Properties: Not available.
Solubility: Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.
Instability Temperature: Not available.
Conditions of Instability: Not available.
Incompatibility with various substances: Reactive with reducing agents, combustible materials, organic materials, acids.
Corrosivity: Non-corrosive in presence of glass.
Special Remarks on Reactivity:
Incompatible with easily oxidizable materials, sulfur, sulfides, phosphides, hypophosphites, chlorates, peroxides, aluminum powder, rubidium acetylide, potassium azide, chlorine trifluoride. Reacts with hydrochloric acid to form corrosive chlorine gas. Heating or rubbing with material with organic materials can cause fire hazard.
Special Remarks on Corrosivity: Not available.
Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.
Toxicity to Animals: Acute oral toxicity (LD50): >3478 mg/kg [Rat].
Chronic Effects on Humans: May cause damage to the following organs: blood, the nervous system, liver, central nervous system (CNS).
Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation.
Special Remarks on Toxicity to Animals: Not available.
Special Remarks on Chronic Effects on Humans: May cause adverse reproductive effects. Decrease of sperm count in human.

Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects:
Skin: Causes skin irritation.
Eyes: Causes eye irritation from mechanical action.
Inhalation: Inhalation manganese dioxide fume can cause "fume metal fever", a flu-like illness characterized by chills, fever, aching muscles, dryness in the mouth and throat, headache. It may

irritate the respiratory tract. It may increase the incidence of upper respiratory tract and pulmonary infections. It may also cause emphysema, and acute pulmonary edema. Absorption of inorganic manganese salts through the lungs is poor, but may occur in chronic poisoning.

Ingestion: May cause abdominal pain and nausea. Although manganese salts are poorly absorbed through the intestines, they may produce hypoglycemia, and decreased blood calcium levels could absorption occur.

Chronic Potential Health Effects: Chronic exposure to Manganese dioxide can lead to manganese poisoning, called Manganism. It primarily involves the central nervous system. Early symptoms include languor, sleepiness, poor appetite, and weakness in the legs. Later effects which may include a stolid mask-like appearance of the face, muscle cramps, twitching and tremors, changes in mood and personality, emotional disturbances such as uncontrollable laughter and a spastic gait with tendency to fall while walking as well as anemia are also findings in workers exposed to the dust or fumes of manganese compounds. Later symptoms are identical to Parkinson's disease. Repeated or prolonged exposure may also damage the liver and may cause a decrease in the heart rate. Repeated inhalation of manganese dust may also cause Manganese Pneumonitis, bronchitis with cough, phlegm, and/or shortness breath.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport:

Manganese Dioxide was tested per IATA Oxidizer test, method 3.5.1.2.1 to determine if it should be classified as an oxidizer. This material does not meet the definition of an oxidizer according to IATA Oxidizer test method.

Section 15: Other Regulatory Information

Federal and State Regulations:

Pennsylvania (United States) RTK: Manganese dioxide

New Jersey (United States): Manganese dioxide

TSCA 8(b) inventory: Manganese dioxide

SARA 313 toxic chemical notification and release reporting: Manganese dioxide

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:**WHMIS (Canada):**

CLASS D-2B: Material causing other toxic effects (TOXIC).

Manganese Dioxide was tested per IATA Oxidizer test, method 3.5.1.2.1 to determine if it should be classified as an oxidizer. This material does not meet the definition of an oxidizer according to IATA Oxidizer test, method 3.5.1.2.1

DSCL (EEC):

R20/22- Harmful by inhalation and if swallowed.

S25- Avoid contact with eyes.

HMIS (U.S.A.):

Health Hazard: 2

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 2

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:

Gloves.

Lab coat.

Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Splash goggles.

Section 16: Other Information

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall GoodEarth AgroChem Pvt. Ltd. be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if GoodEarth AgroChem Pvt. Ltd. has been advised of the possibility of such damages.